The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

INVESTOR IN PEOPLE

PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed A M Brewer

Dated 8 June 2004

Patents Form 1/77

Patents Act 1977
(Rule 16)

THE PATENT OFFICE
JA
15 MAY 2003
RECEIVED BY FAX

1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office
Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

TMG/P71128

2. Patent application number
(The Patent Office will fill in this)

0311174.7

P01/7700 0.00-0311174.7

15 MAY 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

BRIAN FRANCIS BAKER
38 STANHOPE ROAD
LONGWELL GREEN
BRISTOL
BS30 9AH

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

8631590001

4. Title of the invention

ANTI-VIRAL CLEANING COMPOSITION

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

T M GREGORY & CO
26 CYRIL STREET
NORTHAMPTON
NN1 5EL

Patents ADP number *(if you know it)*

4323200

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*
–		

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*
–	

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.
See note (d))

–

Patents Form 1/77

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	–
Description	8
Claim(s)	–
Abstract	–
Drawing(s)	–

10. If you are also filing any of the following, state how many against each item.

Priority documents	–
Translations of priority documents	–
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	–
Request for preliminary examination and search (Patents Form 9/77)	–
Request for substantive examination (Patents Form 10/77)	–
Any other documents (Please specify)	–

11. I/We request the grant of a patent on the basis of this application.

Signature T M Gregory & Co Date 15.05.03

12. Name and daytime telephone number of person to contact in the United Kingdom T M GREGORY 01604 632436

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

a) *If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.*

b) *Write your answers in capital letters using black ink or you may type them.*

c) *If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.*

d) *If you have answered 'Yes' Patents Form 7/77 will need to be filed.*

e) *Once you have filled in the form you must remember to sign and date it.*

f) *For details of the fee and ways to pay please contact the Patent Office.*

ANTI-VIRAL CLEANING COMPOSITION

The present invention relates to a liquid cleansing composition having an anti-viral action. More particularly, but not exclusively, it relates to a surface cleansing composition having both anti-viral and anti bacterial activity.

There is increasing concern about bacterial and viral infections being transmitted to patients and staff in hospitals and the like. One vector of infection is believed to be incompletely disinfected surfaces, which may harbour bacteria and/or viruses that are resistant to existing surface cleaning agents. There is a strong suspicion that the spread of the recent SARS (Severe Acute Respiratory Syndrome) outbreak may have been linked to the ability of the SARS virus to resist conventional cleaning agents/disinfectants. Viruses spread from an infected patient thus remain viable and ready to be picked up by and to infect other patients and medical staff. Other pathogens, such as the MRSA bacterium, are also suspected to be surviving existing surface cleaning/disinfecting agents and routines.

It is known to use cationic surfactants, such as quaternary ammonium salts, as dual-purpose surface cleaning agents and bactericides. However, while such materials are generally found to be sufficient to deal with, say, food-poisoning bacteria in a food preparation environment, they are not regarded as sufficiently active to handle more dangerous and more resistant pathogens in a medical context.

Alcohols, such as *iso*-propanol, and halogens, such as iodine, have in the past been used as relatively crude topical disinfecting agents around wounds and skin lesions, but they have not proven suitable for wide area cleaning of hard surfaces and the like. For example, iodine can stain many surfaces, and its use at high concentrations is limited by safety considerations.

It is hence an object of the present invention to provide a liquid cleansing and disinfecting preparation, suitable for use on hard surfaces, with a high anti-viral and anti-bacterial effectiveness.

According to the present invention, there is provided an aqueous surface cleaning and disinfecting preparation comprising at least one aliphatic alcohol, a long-chain alkyl polyamine compound, and iodine.

Preferably, the long-chain alkyl polyamine compound comprises a long-chain alkyl triamine compound.

The composition may comprise a mixture of long-chain alkyl polyamine compounds having a range of different alkyl chain lengths.

Advantageously, the long-chain alkyl polyamine compound comprises a compound of the general formula R-NH-$(CH_2)_m$-NH-$(CH_2)_n$-NH_2, where R is a linear or branched alkyl chain comprising at least eight carbon atoms, and each of m and n equals either 2 or 3.

R may be a linear or branched alkyl chain comprising between ten and fourteen carbon atoms.

Each of m and n may equal 3.

Preferably, the at least one aliphatic alcohol comprises between one and four carbon atoms.

Advantageously, the composition comprises two aliphatic alcohols.

Optionally, the composition comprises ethanol and *n*-propanol.

The composition may comprise between 10% and 30% by volume aliphatic alcohols.

Advantageously, the composition comprises between 15% and 25% by volume aliphatic alcohols.

The composition may comprise between 10% and 20% by volume ethanol and between 5% and 10% by volume *n*-propanol.

Optionally, the composition may comprise between 14% and 16% by volume ethanol and between 5% and 7% by volume *n*-propanol.

The composition preferably comprises up to 0.5% by weight iodine.

Advantageously, the composition comprises between 0.1% and 0.5% by weight iodine.

Optionally, the composition may comprise 0.33% ± 0.05% by weight iodine.

The composition preferably comprises between 10% and 30% by volume of the long-chain alkyl polyamine compound or compounds.

Advantageously, the composition comprises between 15% and 25% of the long-chain alkyl polyamine compound or compounds.

Optionally, the composition may comprise 20% ± 2% of the long-chain alkyl polyamine compound or compounds

The composition may comprise a complexing agent adapted to form a complex with the iodine.

The composition may comprise at least one buffering agent, such as nitrilotriacetic acid or its salts.

The composition may comprise at least one wetting agent, such as a polyglycol ether, optionally a polyethylene glycol ether or a polypropylene glycol ether.

An embodiment of the present invention will now be described more particularly by way of example.

An aqueous surface cleaning composition was prepared, comprising:

NTA 89% powder	0.85 kg
Ethanol	15.0 litres
n-Propanol	6.0 litres
Topanol O FG	0.55 litres
Sandoteric SC	2.42 litres
Sandozin NRW conc	6.95 litres
Sandoteric ABD	4.45 litres
Triameen Y12D-3 D	19.99 litres
Deionised water	43.4524 litres
Iodine (solid)	0.3376 kg

The composition appeared as a pale yellow clear liquid with a pH of approximately 8 and a slight alcoholic odour.

NTA is nitrilotriacetic acid trisodium salt, a buffering agent. Topanol O FG is food-grade butylated hydroxytoluene, an antioxidant, sold by Chance & Hunt Ltd. (Topanol is a registered trade mark of ICI plc). Sandozin NRW conc is a polyethoxylate ether sold by

Clariant as a wetting agent. It also forms a relatively stable complex with iodine. Sandoteric SC is a sulphobetaine amphoteric surfactant, which acts as a detergent, and Sandoteric ABD is a complex mixture of amphoteric surfactants acting as a detergent and having a degree of bactericidal activity. Both are sold by Clariant. (Sandozin and Sandoteric are registered trade marks of Novartis S A) Triameen Y12D-30 is a long-chain alkyl triamine of the general formula R'-NH-C_3H_6-NH-C_3H_6-NH_2, where R' is a "tallow alkyl" – a naturally-derived mixture of alkyl chains of different lengths, the most common of which is a dodecyl chain. It is sold by Akzo Nobel.

It is believed that in a suitably buffered solution, the triamine forms a cationic species. Together with the amphoteric surfactants, it attacks the phospholipid membranes which form the outer wall of a bacterium or the capsid of a virus. In most cases, these membranes are ruptured or lysed, leading to release of the bacterium's DNA or the virus' RNA, as the case may be. The complexed iodine and the alcohols are believed to act in conjunction on viral RNA, effectively destroying it and eradicating the virus. The triamine and the amphoteric surfactants are believed either to attack and cleave bacterial DNA, or to bind to critical parts of the helix, in either case preventing it from replicating. The alcohols may also contribute to the attack on the membranes.

Even where the membranes are not sufficiently damaged to release their contents for destruction, the composition is found to inactivate the bacterium or virus for prolonged periods (at least 14 days in current testing, much longer than for current cleaners/disinfectants).

The combined action of the components of the composition is thus to break up and destroy a majority of bacteria and viruses, and to inactivate undestroyed bacteria and viruses for prolonged periods. The composition also has a conventional detergent/cleansing effect, removing macroscopic soiling from a surface to which it is applied, as well as washing off undestroyed bacteria/viruses and the debris of the destroyed. It has been found to have minimal deleterious effect on the surfaces tested, and does not stain surfaces as would conventional formulation containing similar levels of iodine.

It is hypothesised that compositions with higher levels of iodine may be useful in some applications, although alterations to the other components, such as raised levels of one or both alcohols, may then be needed for stability.

The composition also has a degree of activity against fungi, moulds and yeasts, although it is believed that a modified formulation, for example with an alternative alcohol blend, might be required for full effectiveness against the tougher walls of fungal spore cells and the like.

Testing has shown that the composition passes the standard "555-challenge" test (see British Standard BS EN 1276:1997 and the French Afnor test). As an effective anti-viral and anti-bacterial cleansing agent it may be categorised as a (2) category disinfectant in the system employed by the UK National Health Service, suitable for cleaning in "medium high risk" areas.

In the stringent RNA destruction test using canine poliovirus and Norwalk virus, the composition described passes the test at very high RNA concentrations, considerably outperforming conventional systems. It is therefore believed that the composition is

sufficiently active that even robust and highly resistant pathogens such as the SARS virus will be substantially completely eliminated by a simple washing treatment.

This Page is inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURED OR ILLEGIBLE TEXT OR DRAWING
- ☒ SKEWED/SLANTED IMAGES
- ☐ COLORED OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REPERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning documents *will not* correct images problems checked, please do not report the problems to the IFW Image Problem Mailbox